Short videos to enhance student learning in microbiological laboratory exercises

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Aim

To evaluate the use of short videos to enhance learning in practical laboratory exercises in microbiology.

Introduction

Digital learning objects, such as videos, are increasingly being used as a complement to traditional text books and represents innovative tools to enhance student learning (1, 2).

The use of short videos, uploaded on YouTube, was used to introduce students in a 7.5 ECTS B. Eng., course in Biological Chemistry at the Technical University of Denmark (DTU) to basic techniques being taught during the practical laboratory exercises.

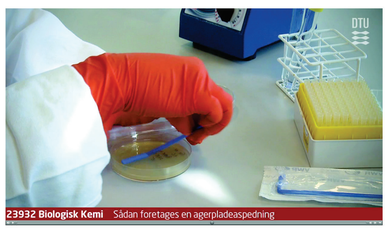
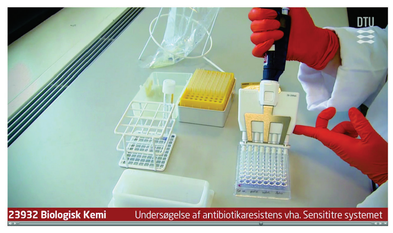
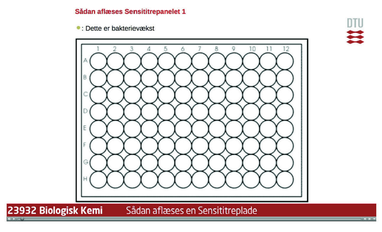
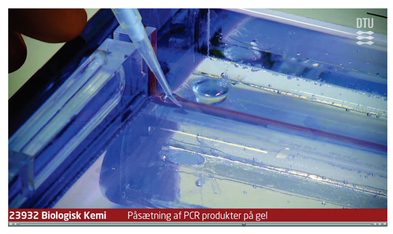
Results

- 83% of the students reported having seen the videos outside class
- All students felt that videos aided their understanding of the laboratory techniques
- Critique from students: videos too long
- Suggestion from students: produce additional videos demonstrating key concepts and cases
- Teachers: “Using videos in class allowed me to spend time on explaining the concepts and conceive misconceptions, rather than the experimental procedures”

Conclusions

- Videos explaining laboratory procedures was found to be a useful complement to the laboratory compendium
- The use of videos allowed students to focus more on conceptual understanding of the exercise and the related theory
- Additional videos explaining key concepts would be beneficial to include in the future

Table 1. Description of the main content of the 8 videos together with screenshots from YouTube and Quick Response (QR) codes that allows easy access for students using e.g. a smartphone.

Main content of video	Screenshot	QR code
How to use a pipette		
How to prepare a dilution series		
How to spread a sample on agar plate		
How to make a pure isolate by sub culturing a single colony		
How to use a Sensititre panel to investigate antimicrobial resistance		
How to interpret a Sensititre panel		
How to separate PCR products by gel electrophoresis		
How to perform a filter conjugation		

Study design

- 8 short videos (3-7 min) (Table 1)
- Uploaded on YouTube and DTU´s podcast channel
- Links (URL and QR code) included in laboratory compendium
- Videos shown before each exercise
- Students encouraged to watch also outside class
- Written evaluation after end of lab course to assess the usefulness for students and teachers of using videos

Acknowledgements

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References

1. McKelvy G. M., (2000) Univ Chem Edu, 4(2)
2. Powell C.B. & Mason D.S. (2013) J Sci Educ Technol

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Download the poster by scanning this QR code: